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EXPERIENCES WITH ALGAE AT DAVENPORT

BY CHARLES R. HENDERSON¹

During July, 1921, the filtered water at the Davenport Water Works was unsatisfactory. The number of bacteria was high and there was more than one positive test for gas formers in five 10-cc. samples tested. Mississippi River is the source of the water. 3.78 grains of alumina per gallon were applied to the raw water, which had a turbidity of 150 parts per million. The water, after treatment with alum, passed through an uncovered concrete settling basin having a sufficient capacity to contain 24 hours flow. 0.74 part per million of chlorine was applied to the settled water before filtration through pressure filters.

Owing to unfavorable conditions the basins had not been cleaned since early spring. On the supposition that the uncleaned basins were the cause of the trouble the basins were cleaned, but without improving the bacteriological conditions of the water. Microscopic examination of the raw water showed vast quantities of algae, "melosira." No tastes or odors accompanied the poor bacteriological condition.

Copper sulphate applied to the water entering the settling basin gave no improvement. There was some clogging of the filter beds but not to a serious extent. As a final remedy the amount of liquid chlorine was increased. To do this it was necessary to increase the capacity of the chlorine apparatus. Half-hourly tests of residual chlorine in the water applied to the filters were made by the potassium iodide starch method. The amount of chlorine was increased by steps until eighteen pounds per million gallons or 2.16 parts per million was used. With this amount of chlorine no residual chlorine was noted in the filtered water when used in any quantity below the maximum, and there was no complaint of tastes or odors in the water delivered to the city. After the algae disappeared from the raw water, sharp reductions in the amount of chlorine used were necessary until the quantity of 4 pounds per million gallons was reached in December, 1921.

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In August, 1921, trouble of an entirely different character occurred in the open 5,000,000-gallon capacity filtered water storage reservoir of the Davenport Water Company. A heavy growth of *oscillaria* developed. An attempt to control the growth by spraying the inside slope and the water around the edge of the reservoir, where the most active growth appeared to be, failed. By this time the odor and taste had become very objectionable and the neighbors were demanding that the reservoir be emptied and cleaned, on the theory that a bad smell meant unclean conditions. The reservoir was emptied and cleaned, in order to satisfy this public clamor. After the reservoir was emptied the slopes and bottom were washed with hose streams and cleaned with brooms. Calcium hypo-chlorite was sprinkled over the entire bottom and the reservoir again washed. Soon after the reservoir was filled with water, algae reappeared. Spraying along the edges was ineffective, and it was not until the whole body of water was treated with copper sulphate by dragging a bag of copper sulphate attached to a float back and forth across the reservoir, that the algae disappeared.

After the whole body was treated with the copper sulphate, the algae disappeared, and no more trouble was experienced during the fall.